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PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of :

Tatsuya Igarashi et al. : Group Art Unit: 1774

Application No. 09/747,933 : Examiner: YAMNITZKY, M

Filed: December 27, 2000 :

For: LIGHT-EMITTING MATERIAL COMPRISING ORTHOMETALATED  
IRIDIUM COMPLEX, LIGHT-EMITTING DEVICE, HIGH EFFICIENCY RED  
LIGHT-EMITTING DEVICE, AND NOVEL IRIDIUM COMPLEX

DECLARATION UNDER 37 CFR §1.132

Honorable Commissioner of Patents and Trademarks  
Washington, D.C. 20231

Sir:

I, Tatsuya Igarashi, do hereby declare and state  
that:

I graduated from Tokyo Institute of Technology,  
Faculty of Engineering, with a Master's Degree in March of  
1993.

Since April of 1993, I have been employed by Fuji  
Photo Film Co., Ltd., and have been engaged in research in  
the field of dyes and other additives for photographic use  
and organic electroluminescence devices since January of  
1997.

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I am a co-inventor of the invention described and claimed in the above-named application, and I am familiar with the Office Action dated June 26, 2002 issued therein.

The following comparative experimentation was conducted by me or under my supervision to demonstrate the unexpected superiority of the present invention.

#### EXPERIMENTATION

##### COMPARATIVE EXAMPLE 1

An ITO substrate washed was placed in an evaporation apparatus, NPD [N,N'-diphenyl-N,N'-di( $\alpha$ -naphthyl)benzidine] was evaporated thereon in a thickness of 50 nm, compound B and compound C (corresponding to a compound where L of the compounds described in Fig. 29, US 2002/0034656A1 is replaced by the arylquinolines described in Fig. 49) were co-evaporated thereon in a ratio (mass ratio) of 34:2 in a thickness of 36 nm, and compound A was evaporated thereon in a thickness of 36 nm. A patterned mask (arranged such that the light-emitting area was 4 mm x 5 mm) was then disposed on the thin organic layer, lithium fluoride was evaporated in a thickness of 1 nm in the evaporation apparatus, and aluminum was evaporated thereon in a thickness of about 200 nm to prepare an EL device. Using a

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source measure unit Type 2400 produced by Toyo Technica Co., Ltd., a dc constant voltage was then applied to the EL device thus prepared to generate the emission of light which was then measured for luminance by means of a luminance meter Type BM-8 produced by Topcon Corp. As a result, the emission of light obtained was of  $EL_{max} = 629$  nm and a chromaticity value  $(x, y) = (0.67, 0.32)$ , and the external quantum efficiency was of 8.3 percent.

#### EXAMPLE 1

Using compound D (corresponding to formula (9) of the present application) in place of compound C, an EL device was prepared and evaluated similarly to Comparative Example 1. As a result, the emission of light obtained was of  $EL_{max} = 567$  nm and a chromaticity value  $(x, y) = (0.50, 0.48)$ , and the external quantum efficiency was 17.7 percent.

#### EXAMPLE 2

Using compound E (corresponding to the tris derivative of formula (20) of the present application) in place of compound C, an EL device was prepared and evaluated similarly to Comparative Example 1. As a result, the emission of light obtained was of  $EL_{max} = 615$  nm and a chromaticity value  $(x, Y) = (0.63, 0.33)$ , and the external

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quantum efficiency was 12.5 percent.

#### EXAMPLE 3

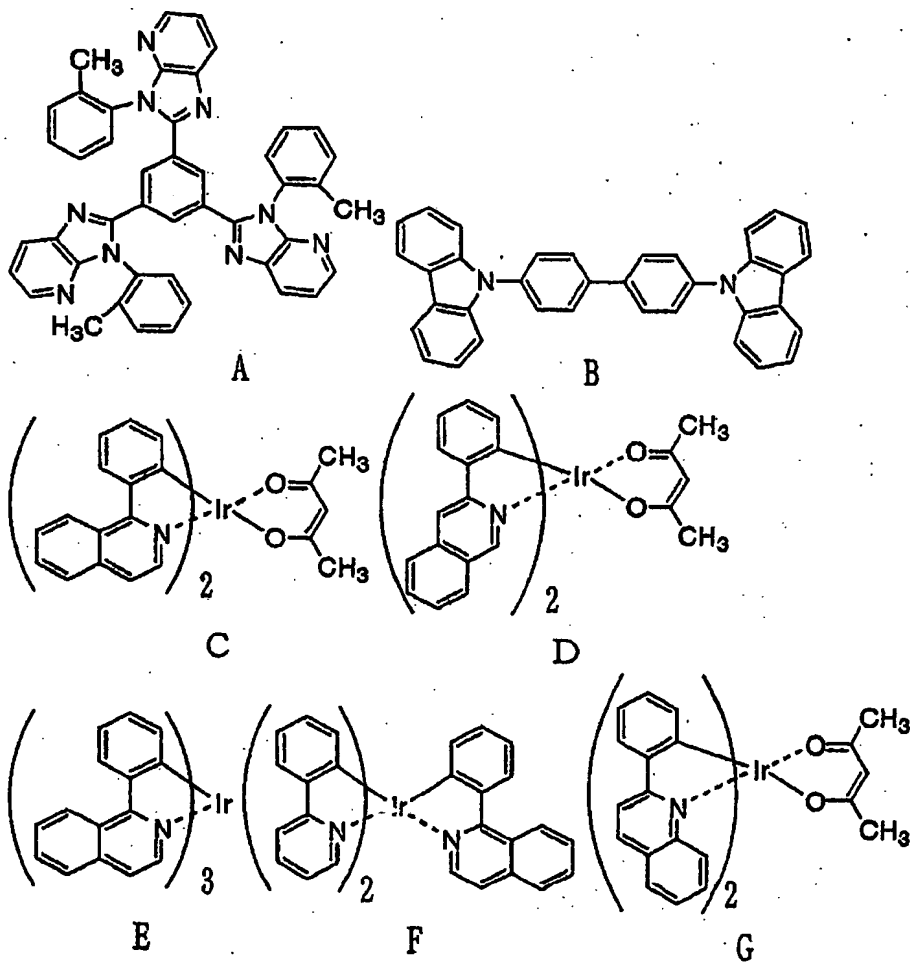
Using compound F (corresponding to a compound containing ortho-metallized ligands of formula (20) of the present application) in place of compound C, an EL device was prepared and evaluated similarly to Comparative Example 1. As a result, the emission of light obtained was of  $EL_{max} = 618$  nm and a chromaticity value  $(x, y) = (0.65, 0.34)$ , and the external quantum efficiency was 10.3 percent.

#### EXAMPLE 4

Using compound G (corresponding to formulae (21) and (22) of the present application) in place of compound C, an EL device was prepared and evaluated similarly to Comparative Example 1. As a result, the emission of light obtained was of  $EL_{max} = 509$  nm and a chromaticity value  $(x, y) = (0.60, 0.39)$ , and the external quantum efficiency was 13.1 percent.

The compounds used herein are shown below.

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I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: 12/19/02

Tatsuya Igarashi  
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